

Cup package of a fibrous material and a method of manufacturing the same

5 The invention relates to a cup package made of a fibre-based material comprising a cup for a product to be packaged and a lid for closing the cup mouth. The invention also relates to a method for manufacturing such a cup package.

10 Fibre-based materials, i.e. plastic-coated packaging board, are used in mass-scale production of disposable drinking cups. The conical cups are delivered for use piled in nested relationship and do not hence require a lid for closing the cup.

15 Board cups are also used in disposable packages for e.g. milk, yoghurt, juices and desserts, and are then equipped with a heat-sealable tear-off lid. The lid material is suitably aluminium or plastic-coated paper or board. Once they have been opened, such packages cannot be closed.

20 Ice cream is delivered in single packages consisting of board cups whose lids, which are also made of board, are retained in position by adhesion between the lid and the ice cream. These packages are not either intended to be closed anew.

Openable and closable cup or container packages made of board are used for jam, marmalade or similar foodstuffs dispensed in small amounts. Usually the lids of such consumer board packages are made of plastic.

25 The purpose of the invention is to provide a cup package with a lid that can be readily opened and closed and in which both the cup and the lid are made of a fibre-based material, such as packaging board. The solution of the invention consists of a package which is characterised by the lid being partially nested in the cup, the adhesion between the inner surface of the cup and the lid retaining the lid in
30 position, with adjacent beads provided at the cup mouth and the edge of the lid to serve as grip bases when the lid is opened.

35 The purpose of the bead disposed at the edge of the lid, which can be produced by mechanical moulding by folding or winding the lid material, is to stiffen the lid, giving it resistance to slight compression as the user grips the lid and lifts or tears it off the cup mouth or presses it back in position in order to seal the cup mouth. At the same time, the stiff bead acts as a stop for the user's fingers, providing a base

for a firm grip, thus ensuring, together with the corresponding bead, easy opening and closing of the package.

5 A bead, such as a mouth roll, formed at the cup mouth, belongs to techniques known *per se* regarding disposable board cups. A mouth roll is manufactured at the final stage of the cup production by bending and/or pressing the board at the cup mouth by means of a moulding tool with utilisation of heat and any adjuvants and humidification of the board. A mouth roll is required for stiffening the cup and it also gives the user the desired sensation in the mouth when drinking from the cup.
10 In this respect, the invention has the central feature of the corresponding mouth roll or like bead being formed also in the lid closing the cup mouth. The cup and the lid can be made from the same fibre-based material, such as plastic-coated, water-repellent or water vapour-proof packaging board, and the beads, such as mouth rolls formed in these, can be produced by the same techniques and have mutually
15 corresponding designs.

The mantle and the lid of the cup can expand conically upwards, with their conical surfaces adhering to each other in opposite relationship when the lid is in position. The conical cup corresponds to conventional drinking cups made of board, and in
20 connection with the invention, the conical design has the additional advantage of providing particularly easy removal of the lid and especially restitution of the lid at the mouth of the cup.

Attachment of the lid and its retention at the mouth of the cup may be based merely
25 on friction and compression between the inner surface of the cup and the lid. In many cases, this provides sufficient seal. However, when necessary, the attachment of the lid can be enhanced by means of beads formed on the opposite adhesion surfaces of the cup and the lid or possibly interlocking beads and engagements.

30 In a preferred embodiment of the invention, the package lid is formed by a combination of a principally discoid centre and a surrounding frame bearing against the inner surface of the cup, the frame having a mouth roll or any like bead at its edge. This means that the cup and the lid may have mutually corresponding basic designs. The lid centre matches the bottom of the cup and the lid frame matches the
35 cup mantle, with the sole difference of the dimensioning of the parts; for the package to get volume, the cup mantle must have sufficient height, whereas the lid frame appropriately has a low height.

The package of the invention can further be applied in such a manner that the package has at least three parts, comprising a lower-most larger-sized cup, a smaller-sized cup partially nested in this and an uppermost lid, each of said parts comprising a mouth roll or like bead, with vertically adjacent beads serving as grip bases when the parts are detached from each other. In such a package, cups of varying volumes placed on top of each other may also have varying contents. One can, for instance, form a food package in which the lower larger-sized cup contains the main product and the upper smaller-sized cup contains trimmings to be used with this, such as seasoning or dressing. The upper cup has not only the function of forming one of the package sections but also to act as a lid for the lower cup. The mouth rolls or like beads on the package sides enable the package to be opened by sections at the user's choice. The lower cup can be opened by detaching the upper cup from it, the upper cup remaining closed with a lid. The upper cup, again can be opened by releasing its lid and by separating the upper cup from the lower one, which remains closed. Of course, all the cups are opened when all of the parts of the package are separated. Accordingly, a separated package can be assembled by connecting its parts in the desired order.

The method of the invention for producing a cup package with a lid relates specifically to a package application in which the cup and the lid have the same two-part basic design. The method is characterised by forming a cup by connecting a principally discoid bottom with the mantle forming the cup sides and by equipping the cup mouth with a surrounding bead, and by forming a lid for closing the cup mouth by connecting the principally discoid centre with a frame partially nested in the cup mantle, and by equipping the edge of the frame with an encircling bead, the cup and the lid being substantially manufactured by mutually corresponding operations, the beads formed in the cup and the lid, in adjacent relationship in the sealed package, serving as grip bases when the package is opened.

The invention is explained in greater detail below by means of examples and with reference to the accompanying drawings, in which

Figure 1 shows a cup package of the invention having a cup and a lid, with the parts separated,

Figure 2 is a partial cross-sectional view of the package of figure 1 in the form of a product package closed with a lid,

5 Figures 3 and 4 show, similarly as figures 1 and 2, a second application of the invention, comprising a three-part package, in which the lid closes an upper cup, which, in turn, acts as a lid for the lower cup,

Figure 5 is a cross-sectional view of an application of the invention comprising parts of the lower cup and the upper cup acting as a lid for this and having beads for interlocking the cups,

Figure 6 illustrates cup parts of figure 5 pressed into nested relationship, and

Figure 7 is a schematic view of the manufacture of the parts of the package of the invention.

Figures 1 and 2 show a cup package made entirely from a fibre-based material, such as e.g. a polyethylene-coated packaging board, the cup package consisting of a cup 1 and a lid 2 closing its mouth. The cup 1 corresponds to a conventional disposable drinking cup made of board, comprising a sealed mantle 3 shaped as a truncated cone, a bottom 4 sealed together with the mantle, and a bead formed in the mantle around the cup mouth, which is a mouth roll 5 moulded mechanically with the aid of heat and moisture. The lid 2, again, comprises a discoid centre 6 and a surrounding sealed frame 7. The frame 7 has an upwardly conically expanding shape corresponding to the mantle 3 of the cup, the cup and the lid being insertable into partially nested relationship as shown in figure 2. Like the cup 1, the lid 2 is also equipped with a mouth roll 8 formed at the edge of the frame.

In the closed package of figure 2, the outer side of the frame 7 of the lid 2 bears against the inner surface of the mantle 3 of the cup 1, their mutual compression and friction retaining the lid in position at the mouth of the cup. The mouth rolls 5, 8 of the cup and the lid are disposed on the outer side of the package as adjacent rings encircling the package. The mouth rolls 5, 8 act as stiffeners of the cup and the lid, and especially the mouth roll 8 acts as a stop, which the user can grip with his/her fingers when opening the lid. Similarly, the user easily pushes the lid 2 into position by pressing the mouth roll 8 while closing the package.

The package described above can constitute a product package marketed for consumers, in which the cup contains the packaged product 9 and is closed by the lid 2. The package is suitable especially for sweets and dry snack products, but also e.g. for ready-made foods, jams, marmalades and desserts with adequately firm consistence. In addition, the package of the invention can be used e.g. as a drinking cup or a receptacle for sweets or similar dry snack products, which need to be temporarily closed with a lid after the drink has been poured or the product dispensed.

The three-part cup package illustrated in figures 3 and 4 is formed of a lower cup 1, an upper cup 10 partially nested in this and serving as a lid for the lower cup, and a lid 2 closing the upper cup and partially nested in this. The nested mantle or frame parts 3, 11, 7 of the parts 1, 10, 2 have been given a conically upwardly expanding shape and each part comprises a discoid bottom 4, 12 or a centre 6 surrounded by the mantle 3, 11 or frame 7. The parts 1, 10, 2 can be manufactured by the same techniques on principle, and each of them has been provided with a mouth roll 5, 13, 8 encircling the mouth or edge of the part.

A three-part package closed as in figure 4 may form a product package, in which the product 9 contained in the lower cup 1 and the product 14 contained in the upper cup 10 of smaller height differ from each other in quantity and quality. The main product 5, present in a larger amount, may be e.g. a ready-made food, a snack or a dessert, and the product 14 contained in the upper cup 10 can consist of trimmings to be combined with the main product, such as e.g. seasoning or dressing. The mouth rolls 5, 13 8 disposed adjacent each other on the sides of the package enable all of the three parts 1, 10, 2 to be detached from each other, or, if desired, the lower cup 1 to be opened by detaching the upper cup 10 from this, the upper cup remaining closed by the lid 2, or the upper cup 10 to be opened without detaching it from the lower cup 1, which thus remains sealed.

Figures 5 and 6 give examples of beads and recesses formed if necessary in the nested parts 1, 10 of the package in order to enhance the attachment between the parts. An annular bead has been moulded in the mantle 3 of the lower cup 1, in the vicinity of the mouth roll 5 forming its upper edge, the bead being visible as an annular recess 15 in the inner surface of the mantle. Protruding nodules 16 have been similarly moulded on the outer surface of the mantle 11 of the upper cup 10 of lower height, these nodules engaging said annular recess 15 when the cups are

pushed into nested relationship, cf. figure 6. The detailed embodiment of such a design for enhancing the attachment between the parts may vary, and they can be provided also between the upper cup 10 and its closing lid (not illustrated in figures 5 and 6) or in a two-part package.

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Figure 7 shows step by step a process for manufacturing the cup package of the invention. The figure relates to the manufacture of a cup 1 for receiving a product to be packaged or a main product, however, the manufacture of the other parts of the package, i.e. the lid and any lower cups, is performed in the same manner on principle.

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The package material may be a package board whose one or both faces are extrusion-coated with polyethene, for instance. Bottom blanks 20 and mantle blanks 21 are cut by punches 19 from board webs 17, 18. A border 23 surrounding the bottom 4 is moulded in each bottom blank 20 with a compression-moulding press 22. The mantle blanks 21 are wound about a conical moulding tool 24 and are sealed by means of coating plastic to form mantle parts 3 having the shape of a truncated cone. If the board is plastic-coated on the one side alone, the coating forms the upper surface of the moulded bottom 4 and the inner surface of the seamed mantle 3. Next, the bottom 4 and the mantle 3 are fitted together and the lower edge 25 of the mantle is bent and sealed by heat-sealable coating plastic against the border 23 moulded in the bottom. The seals provide a liquid-proof cup. Finally, a mouth roll is formed in the cup by placing the cup on a stationary substrate 26 and by moulding vertically by means of a reciprocating striking tool 27. The heatable tool 27 comprises an annular groove 28, which hits the upper edge of the cup mantle 3, forcing this to be bent outwardly and downwardly and to be rolled so as to form a protruding bead on the mantle mouth. This work step requires the mouldable location of the board to be softened by moisturising, for instance, in order to achieve a permanent bead, i.e. mouth roll 5.

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The manufacture of the upper cup 10 of lower height in a three-part package illustrated in figures 3 and 4 may be performed as described above in connection with figure 7. The sole difference from figure 7 is the design of the mantle blank 21 resulting in the lower cup. The manufacture of the lid 2 of the package may be performed with similar operations, except that the lid frame 7 corresponding to the cup mantle is narrower than above.

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It is obvious to those skilled in the art that the embodiments of the invention are not restricted to the examples given above, but may vary within the scope of the following examples. Thus, instead of extrusion-coated board, the package material may be dispersion-coated board, the chemical providing the liquid proofness of the board being e.g. styrene acrylate, polyvinyl acetate (PVAC) or any fluorine chemical. The package can also be manufactured in accordance with the description above from a board that has not been plastic coated, and the inner surfaces of the cup and the lid can be subsequently treated by spraying an applicable coating providing liquid proofness, such as paraffin or wax. In packages for sweets or similar dry products, it is also possible to use a material that has no plastic-coating at all.